ABOUT US

SANDEEP ENTERPRISES

Sandeep Enterprises (An ISO 9001 : 2015 Certified Company) is a second generation Steel Trading & Stock Holding Company dealing in all kinds of Tool Steel, High Speed Steel, Stainless Steel and Alloy Steel. Being in this trade for more than half a century our basic aim is to keep our customers on the leading edge now & in future. We also strive to go a step ahead in our services and have upgraded ourselves to the new products and developments in the industry. We have added new products in our stock programme as and when required.

To service better and respond faster to our domestic customers need we have branches in Mumbai, Ludhiana, Sonipat, Chennai, Coimbatore & Bangalore other than New Delhi. Our warehouse facilities are in Delhi, Mumbai, Ludhiana & Sonipat. We have tied up among the best & biggest brands in the industry from all over the world to deliver our customers in India and Overseas the best of the quality in minimum lead time.

We are committed to establish the name of Sandeep Enterprises as an organization of Trust providing Cost Effective Special Steels to establish Brand Equity of Sandeep Enterprises and meet all said and implied needs of customers to create total satisfaction through highly motivated employees involvement and established continual improving quality management systems.

We believe that NO QUANTITY is too big or small to deliver and NO CUSTOMER is too big or too small to service.

We have complete variety of all the products in a wide range of sizes in our Stocking Programme and can deliver in various sections of rounds, flats, sheets, squares, wire rods, etc. We can also arrange from our various Principals any specific grade and quantity which is not a part of our regular stock programme and in minimum possible time from the stocks of our various International Partners. We have in-house cutting facilities and production facilities for making Cold Rolling Mill Rods.

INFRA FACILITIES

TESTING FACILITIES:

We have in-house testing facilities.

1. NDT - Ultrasonic Testing - MODSONIC
2. Microstructure Analysis: 1000 x Microscopic
3. Hardness Testers:
   - ROCKWELL
   - BRINELL
   - POLDI

LATHE:

350 mm Dia x 3,000 mm

MILLING & PLAINING:

Width upto 600 mm Length 3000 mm

SURFACE & CUP GRINDING:

Width upto 1000 mm Length 3000 mm

LOGISTICS:

Self Owned Trucks: For all Capacities from 1,000 kg upto 10,000kg

COLD WORK TOOL STEELS

These steels are aimed at the manufacturing of tools used in cold processing of other steels, cast irons and non ferrous metals. They include all high chromium class 'D' medium alloy - air hardening Class 'A' alloys, Water hardening 'W' alloys and oil hardening 'O' alloys, Cold Work Steels are generally used at working temperature of under 200°C. High installed hardness valued and adequate ductility are characteristics of this group of steels.

THE MOST IMPORTANT PROPERTIES LOOKED INTO COLD WORK TOOL STEELS ARE:

- High wear Resistance of dies
- Resistance to chipping off & cracking
- Good machinability
- Higher hardness, Strength & Toughness
- Dimensional stability on heat treatment

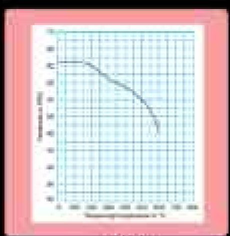
APPLICATIONS:

- Stamping Dies
- Sheet Metal Components
- Rolls for Cold Rolling Mills
- Drawing Tools
- Punches & coining tools
- Cutting Tools
- Pressing Tools
- Shear Blades

COLD WORK TOOL STEELS

MATERIAL				CHEMISTRY									SUPPLY CONDITION		HEAT TREATMENT DETAILS					
AISI/ASTM	DIN	W.Nr	JIS	C	Si	Mn	P(max)	S(max)	Cr	W	Mo	V	Supply Condition	Supply Hardness (HB)	Annealing (Slow Cooling)	Quenchant (Hot Bath)	Quenching	Tempering (Air Cool-ing)	Annealed (HB) Max	Hardness(HRC) Tempered
D-3	X210Cr12	1.2080	SKD1	1.90-2.20	0.10-0.60	0.20-0.60	0.03	0.03	11.0-13.0				Annealed	240	800-840	Oil/AIR	930-980	180-250	240	58-64
D-2	X155CrVMo12-1	1.2379	SKD11	1.45-1.60	0.10-0.60	0.20-0.60	0.03	0.03	11.0-13.0		0.70-1.00	0.70-1.00	Annealed	240	800-850	Oil/AIR	1000-1080	180-250	240	58-63
O-1	100MnCrW4	1.2510	SKS3	0.90-1.05	0.15-0.35	1.00-1.20	0.035	0.035	0.50-0.70	0.50-0.70		0.05-0.15	Annealed	240	740-770	OIL	780-820	180-250	240	63-64
S-1	60WCrV7	1.2550		0.55-0.65	0.70-1.00	0.15-0.45	0.03	0.03	0.90-1.20	1.70-2.20		0.10-0.20	Annealed	240	710-750	OIL	860-900	180-300	240	48-60
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	Annealed	240	[illegible]	OIL	[illegible]	[illegible]	240	[illegible]
SAE 52100	100Cr6	1.3505		0.90-1.05	0.15-0.35	0.25-0.45	0.03	0.025	1.35-1.60				Annealed	240	730-760	OIL	830-870	150-170	240	58-62
			QCM8	PATENTED									Annealed	240	830-880	Oil/AIR	1020-1050	500-550	240	55-62
			SX105V	PATENTED									Annealed	240	NA	FLAME HARDENING	NA	NA	240	56-58
			SXACE	PATENTED									Annealed	240	NA	NA	NA	NA	NA	58-62

TEMPERING CURVES



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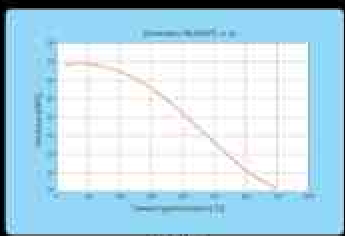

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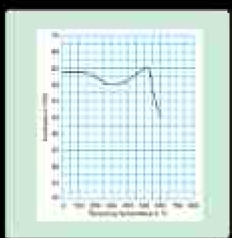

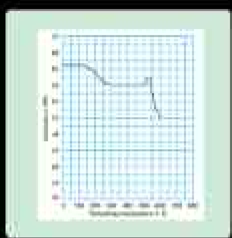

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PLASTIC MOULD STEELS

These steels are used as moulds for plastic products. The plastic industry has involved with various changes at a very fast pace and various grades of plastic mould steel have been developed for various applications. Plastic Mould Steel includes all low-carbon and one medium carbon class 'p' tool steel.

INHERENT PROPERTIES & CHARACTERISTICS:

- High Wear Resistance
- High Corrosion Resistance
- Good Mirror Finish
- Easy & High Surface machinability
- High polishability
- Uniform Hardness

APPLICATIONS:

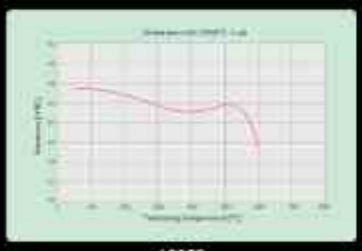
- Mould Frames
- Machine Tool Engineering
- Die Casting Industry
- Compression and injection moulds for plastic industry
- Preform Dies

GRADE	APPLICATION	PLASTIC MATERIAL
1.2311	Large Dies, Mould base, Cost effective dies, inserts	ABS, PP, PC, PS, All non corrosive plastics
1.2738	Engineering components, lower cycle time components, House hold items	ABS, PP, PC, PS, All non corrosive plastics
VR 400	Automobile components, House hold items with large production, higher Asthetic surface moulds	ABS, PP, PC, PS, All non corrosive plastics
VR 300	Automobile components, House hold items with large production, higher Asthetic surface moulds	ABS, PP, PC, PS, All non corrosive plastics
1.2316	U - PVC dies, Engneering components	U - PVC, Nylon
1.2316 HH	U - PVC dies, Engneering components with glass added	C - PVC, Nylon, SAN, Styrin
1.2085	Mould base, rubber moulds	All rubber, FRP
1.2083	PET performs, Caps & Clousers, Components with higher glass added, PVC moulds	PET, ABS, PVC

PLASTIC MOULD STEELS

MATERIAL			CHEMISTRY								SUPPLY CONDITION		HEAT TREATMENT DETAILS					
DIN	W.Nr.	AIS	C	Si	Mn	P max	S (max)	Cr	Mo	Ni	Supply Condition	Supply Hardness (HB)	Annealing (Slow Cooling)	Quenching (Hot Bath)	Quenching	Tempering (Air Cooling)	Annealed (HB) Max	Hardness(HRC) Tempered
X42Cr13	1.2083	SUS420F	0.38-0.45	<=1.00	<=1.00	0.03	0.03	12.50-14.00			Annealed	240	750-800	OIL	1000-1050	250-570	240	45-55
X90CrMoV18	1.2316	SUS440c	0.85-0.95	<=0.005	<=1.00	0.03	0.03	15.50-17.50	0.80-1.30	<=1.00	Q & T	280-320	780-820	OIL	1030-1050	600-800	240	34-40
90CrMoV8	1.2311		0.35-0.45	0.20-0.40	1.30-1.60	0.03	0.03	1.80-2.10	0.15-0.25		Q & T	280-320	830-900	OIL/AIR	550-680	600-680	240	30-36
40CrMnNiMo8-6-4	1.2312		0.35-0.45	0.20-0.40	1.40-1.60	0.03	0.03	1.80-2.00	0.15-0.25		Q & T	280-320	720-780	OIL/AIR	540-670	600-680	240	30-36
40CrMnNiMo8-6-4	1.2738		0.35-0.45	0.20-0.40	1.30-1.60	0.03	0.03	1.80-2.10	0.15-0.25	0.90-1.20	Q & T	280-320	710-760	OIL/AIR	540-660	600-680	240	30-36
VR60	2738 HH		0.37-0.43	0.20	1.30-1.60	0.010	0.001	1.90-1.40	0.40-0.60	1.05-1.25	Q & T	360-400	830-850	Oil/Polymer	850-880	880-930	240	37-41
VR300			0.35-0.45	0.020-0.30	1.40-1.60	0.030	0.020	1.80-2.00	0.15-0.25	0.50-0.70	Q & T	280-320	720-780	Oil/Polymer	830-850	880-930	240	37-41
	1.2085		0.28-0.35	<=1.00	<=1.40	<=0.030	0.05-0.10	15.00-17.00			Q & T	240	830-850	OIL/AIR	1000-1050	600-700	240	33-38
	1.2316 HH		0.28	0.20	0.8	0.005	0.003	14	1	0.7	Q & T	360-400	870-920	Air/Polymer	950-1000	600-700	240	38-42

TEMPERING CURVES



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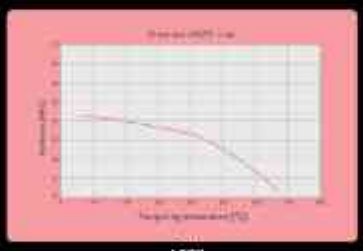

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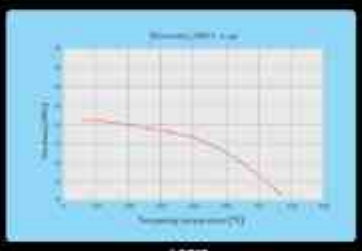

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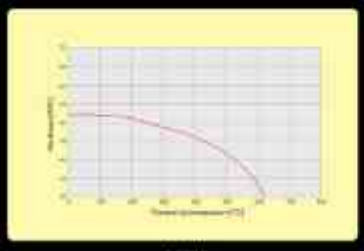

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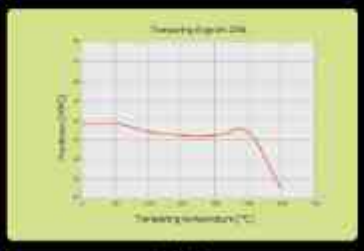

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HOT WORK TOOL STEELS

GENERAL

Hot Work Tool Steels are used for dies for hot forming of work pieces made of ferrous & non-ferrous metals and plastic processing at high temperatures. Hot work tool steel includes all chromium, tungsten and molybdenum class 'H' alloys.

AND THESE HIGH TEMPERATURES OF USUALLY MORE THAN 200°C, THE INHERENT QUALITY OF THE STEEL SHOULD BE:

- High Wear Resistance
- High Corrosion Resistance
- Good Mirror Finish
- Easy & High Surface machinability
- High polishability
- Uniform Hardness

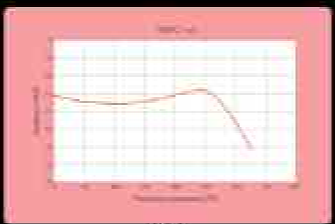
APPLICATION OF HOT WORK TOOL STEEL:

- Pressure Die Casting
- Extrusion
- Forging & Forming Dies
- Punches/Dies for Extrusion on Non Ferrous Alloys
- Hot Shearing Blades
- Moulds for plastic polymer products
- Rolling Mill Rolls
- Head piercing
- Trimming dies

HOT WORK TOOL STEELS

	MATERIAL			CHEMISTRY										SUPPLY CONDITION		HEAT TREATMENT DETAILS					
AISI/ ASTM	DIN	W.Nr	JIS	C	Si	Mn	P (max)	S (max)	Cr	W	Mo	Ni	V	Supply Condition	Supply Hardness (HB)	Annealing (Slow Cooling)	Quenchant (Hot Bath)	Quenching	Tempering (Air Cooling)	Annealed (HB) Max	Hardness (HRC) Tempered
H-11	X38CrMoV5-1	1.2343	SKD6	0.33-0.41	0.80-1.20	0.25-0.50	0.03	0.03	4.80-5.50		1.10-1.50		0.30-0.50	Annealed	240	750-800	OIL/AIR	1000-1040	500-600	240	48-54
H-13	X40CrMoV5-1	1.2344	SKD61	0.35-0.42	0.80-1.20	0.25-0.50	0.03	0.03	4.80-5.50		1.20-1.50		0.85-1.15	Annealed	240	750-800	OIL/AIR	1020-1080	500-600	240	50-54
H-10	X32CrMoV33	1.2365	SKD7	0.28-0.35	0.10-0.40	0.15-0.45	0.03	0.03	2.70-3.20		2.50-3.00		0.40-0.70	Annealed	240	750-800	OIL/AIR	1020-1060	550-600	240	47-52
DB-6	55NiCrMoV7	1.2714	SKT-4	0.50-0.60	0.10-0.40	0.60-0.90	0.03	0.03	0.80-1.20		0.35-0.55	1.50-1.80	0.05-0.15	Q & T	380-420	680-720	OIL/AIR	840-880	400-600	240	36-46
H-21	X30WCrV9-3	1.2581	SKD5	0.25-0.35	0.10-0.40	0.15-0.45	0.035	0.035	2.50-3.20	8.50-9.50			0.30-0.50	Annealed	240	750-800	OIL/AIR	1070-1150	550-650	240	48-52
			QH2	PATENTED										Annealed	240	800-850	OIL	1120-1160	530-650	240	55-60
			QDH	PATENTED										Annealed	240	820-860	OIL/AIR	1020-1050	570-650	240	45-50

TEMPERING CURVES



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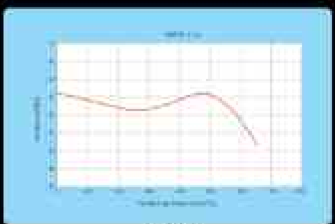

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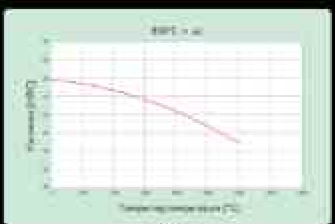

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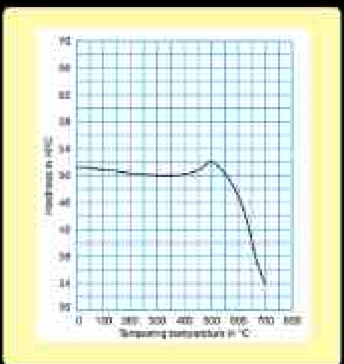

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HIGH SPEED STEEL

High Speed alloys include all molybdenum (M1 to M52) and tungsten (T1 to T15) class alloys. High speed tools steels can be hardened to 62-67 HRC and can maintain this hardness in service temperatures as 540°C (1004°F), making them very useful in high speed machinery. This means the greater machinery capacity is achieved for longer periods of time with no loss of cutting power or edge. Their working characteristics depend mainly on their retention of tempering, the red hardness of the hardened and tempered matrix and the presence of hard carbides that are compounds of chrome, molybdenum, vanadium and tungsten with carbon. this high carbide content is responsible for the strong resistance to wear.

APPLICATIONS:

- Broaching Tools
- Cold work Tools/Punches
- Machining Tools/Planer Tools/Lathe Tools
- Metal Saws
- Metal Cutters
- Reamers/Taps/Drills/End Mills
- Chasers/Hobs
- Wood Work Tools

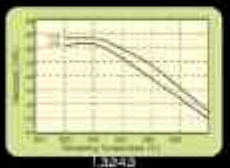
PROPERTIES:

- High working hardness
- High wear resistance
- Excellent toughness
- High retention of tempering & Red harness
  Fine Robustness
- High compression strength

HIGH SPEED STEEL

	MATERIAL			CHEMISTRY										SUPPLY CONDITION		HEAT TREATMENT DETAILS					
AISI/ ASSAB	DIN	W.Nr	JIS	C	Si (max)	Mn (max)	P (max)	S (max)	Cu	Cr	Mo	V	W	Supply Condition	Supply Hardness (HB)	Annealing (Slow Cooling)	Quenchant (Hot Bath)	Quenching	Tempering (Air Cooling)	Air-treated (HB) Min	Hardness(HRC) Tempered
M-2	S 6-5-2	1.3343	SKH51	0.85-0.94	<0.45	<0.40	0.03	0.03		3.80-4.50	4.70-5.20	1.70-2.00	5.90-6.70	Annealed	240	780-800	OIL	1200-1240	540-570	240	63-66
M-3/1	S 6-5-3-2	1.3243	SKH55	0.87-0.95	<0.45	<0.40	0.03	0.03	4.50-5.00	3.80-4.50	4.70-5.20	1.70-2.10	5.90-6.70	Annealed	240	780-830	OIL	1200-1240	550-580	240	64-66
M-42	S 2-10-1-8	1.3247	SKH59	1.05-1.15	~ 0.70	<0.40	0.03	0.03	7.50-8.50	3.50-4.50	9.00-10.00	0.90-1.30	1.20-1.90	Annealed	240	770-820	OIL	1170-1220	510-540	240	67-69
T1	HS 18-0-1	1.3255	SKH2	0.70-0.80	<0.45	<0.40	0.03	0.03		3.80-4.50		1.00-1.20	17.20-18.70	Annealed	240	800-850	OIL	1250-1300	550-580	240	64-66
T4	S 18-1-2-5	1.3255		0.75-0.83	<0.45	<0.40	0.03	0.03	4.50-5.00	3.80-4.50	0.10-0.80	1.40-1.70	17.5-18.5	Annealed	240	820-850	OIL	1250-1300	550-580	240	64-66

TEMPERING CURVES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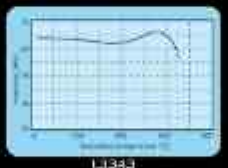
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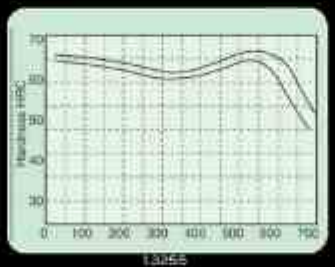

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EXTRUSION INDUSTRY

Extrusion is hot forming process enabling the manufacture of solid and hollow profiles by forcing a pre heated black/billet under high hydraulic pressure through the tool. the hot extrusion is done at fairly high temperature which is 50 -75% of the melting point of the metal. this process is more common in non-ferrous metal like aluminum, brass, copper, etc. the tools in extrusion presses are subject to high level of mechanical and thermal load/stress enhance are required to have the following properties:

- High Temperature Strengh with High Wear Resistance.
- High Tempering resistance.
- Tolerance to alternating to thermal stress.
- Good machinability.
- Good toughness qualities at elevated temperatures.
- Good compressive strength.

Hence during extrusion the die's dimensional stability and shape retention are crucial for the production of precision profiles and for other products of high quality.
Many factors have influence on the final life of extrusion tooling and selection of tool steel material:

- Design of the tool & Die
- Heat treatment process
- Careful machining
- Production process condition (hard and soft alloys, extrusion speed)
- Handling (pre-heating etc.)
- Maintenance
- Surface Treatment
- Good lubrication

The above parameters regarding the choice of tool steel would results in various benefits for the die caster/user as below:

- Long service Life
- Low die cost per production unit
- Low repair frequency
- Good repair weldability
- High dimensional stability
- Low tool turnover
- Low susceptibility

Therefore the correct choice of tools and the process thereafter on the tool is very important for the benefit and productability of the industry as a whole.
We therefore offer our customer the best of the material and most suitable option without compromising on the quality.
The most frequently used grades for extrusion tools and components are 1.2344/H-13, 1.2714/DB-6 & 1.2343/H-11 depending upon the product.

FORGING INDUSTRY

Forging is the working of metals into the required shape by hammering or pressing. It is a non cutting shaping of metals between two tools. It is normally done for steel material. Forged pieces are used whenever the requirements for the mechanical properties of forged components are high. The oldest form of metal working arts (Primitive Blacksmith), thereafter replacement of machinery occurred during the Industrial Revolution. Forging machines are now capable of making parts ranging in size of a Bolt to a Turbine.

The forging is carried by different process namely HOT & COLD FORGING:

HOT FORGING

1. Drop Forging by Forging Hammers (Good for mass production of complex shapes):
   Drop forging with hammers involves forming in two tool halves which are moved in opposite directions and by impacting/applying a great amount of pressure on the material with a forging hammer. Key material requirements for the various forging tools are:

- Good high temperature toughness.
- Optimal wear resistance at high temperature.
- Must remain unaffected by short term temperature fluctuation.
- High level of hardness, ductility and fatigue strength.
- High yield strength and elongation strength.
- Pronounced insusceptibility to hot cracking.
- Sound Tempering strength.

When forging with a hammer the forging piece is only contacted with the die for a short period of time, therefore good toughness is very important as mechanical stress is high.

2. Press Forging (Provide deeper penetration better properties more homogeneous) in comparison press forging generates less mechanical stress but extreme temperature strain as the contact during forging occurs over a longer period of time between the die and the forging piece therefore in such a case the dia insert for press dies require high alloyed steel grade with a chromium-molybdenum base.

WARM & COLD FORGING

It is a precision forging which has inherent benefits like good material yield, good mechanical properties and close tolerances. Though it is more costly than commercial forging but saving in material and machining costs are significant. Forming complex shapes is possible and it represents a higher value addition then a conventional forging. The forging temperature is less than 250°C for cold forging & 540 - 815°C for warm forging, which is much less than 950 - 1150°C for hot forging, thereby resulting in a huge saving of Energy Cost. This is the forging process of the Future.

The typical steel grades used for this application are 1.2714/DB-6, 1.2344/H-13, 1.2343/H-11, QDH, QHZ

COLD STAMPING

The process is by using Cold Worl Tool Steels and High Speed Steel. The normal working temperature of around 200°C is for Cold Work Tool Steel & High Speed Steel has working temperature of around of 600°C. High Speed Steel and has a main characteristic of High working hardness of approx 60 - 70 HRC, thereby resulting in a high wear resistance.

TYPICAL APPLICATIONS:

- Stamping, punching, shearing and cutting tools.
- Cold forging, coining, pressing, bending, deep drawing and Cold extrusion.
- Machining tools.
- Thread rolling dies & rolling rolls (Straightening & Bending rolls)
- Tool holders.
- Hand & power tools.

COLD WORK TOOL STEELS SHOULD EXHIBIT THE FOLLOWING PROPERTIES:

- Good Machinabilty.
- Dimensional Stability on Heat Treatment.
- High Wear Resistance.
- Excellent Toughness.
- High Compression strength.
- Adequate Ductility.

Correct choice of tool steel will result in huge cost efficiency. the same is achieved through constantly High quality, long tool lives with reduced cost and a minimization of downtimes with mimimum tool breakage and edge roughness.

THIS WILL RESULT IN THE ULTIMATE BENEFIT FOR THE USER AS BELOW:

- Long service life
- Low tool cost
- Less machine downtime
- Higher profitability

The typical steel grades used for this application are
1.2080/D-3, 1.2379/D-2, 1.2510/01, 1.2436/D-6, 1.2550/S-1, 1.3343/M-2

OUR NETWORK

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